

Figure 2-6.-Portable scales.

Step 5. Determine the forward axle weight (FAW). The FAW is the total weight reading of the scales under each front tire. Example: The left front tire scale reads 3,000 pounds, and the right front tire scale reads 3,000 pounds, and the FAW equals 6,000 pounds. This "FAW" is written (FAW 6,000) on a piece of weather-resistant material, such as duct tape, with a grease pencil, and attached to the vehicle fender above the axle. Remember, this tape must be

removed upon arrival at the site to avoid the removal of the paint on the vehicle.

Step 6. Determine the intermediate axle weight (IAW). The IAW is the total weight reading of the scales under the intermediate tires. Follow the procedures for Step 5 and label the reading as "IAW" on the masking tape. Remember, the IAW is the weight readings of both scales added together and recorded in pounds.

Step 7. Determine the rear axle weight (RAW). The RAW is the total weight reading of the scales under the rear tires. Follow the procedures for Step 5 and label the reading as "RAW" on the masking tape. Remember, the RAW is the weight readings of both scales added together and recorded in pounds.

**NOTE:** The RAW for vehicles with tandem axles is the weight of the IAW and the RAW added together and labeled above the trunnion (fig. 2-7).

Step 8. Compute moment 1 (Ml). The formula for M 1 is distance 1 times the forward axle weight or D1 x FAW = M1.

Step 9. Compute moment 2 (M2). The formula for M2 is distance 2 times the intermediate axle weight or  $D2 \times IAW = M2$ 

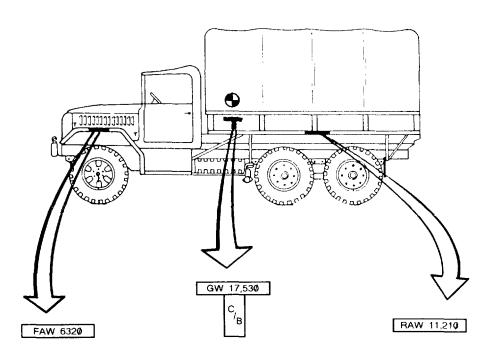


Figure 2-7.—Marking procedures.

TO DETERMINE CENTER OF BALANCE
DRIVE VEHICLE ONTO WOODEN BEAM
UNTIL IT BALANCES

Figure 2-8.—Weight and balance of tracked vehicle.

Step 10. Compute moment 3 (M3). The formula for M3 is distance 3 times the rear axle weight or D3 X RAW = M3.

Step 11. Compute the gross vehicle weight (GVW). The formula for GVW is FAW + IAW + RAW = GVW.

Step 12. Determine the total moment (TM). TM is determined by adding all the moments together. The formula is Ml + M2 + M3 = TM.

Step 13. Compute the center of balance (C/B) of the vehicle. This is done by dividing the GVW into the total moment, which provides the C/B value in inches.

Step 14. Locate the center of balance (C/B). The C/B is located by measuring from the RDL the number of inches computed in Step 13. At that point, label on the side of the vehicle with masking tape, a letter "T." The horizontal portion of the tape is labeled "GVW" plus the weight. The vertical portion of the tape is labeled "C/B" and the distance in inches measured from the RDL (fig. 2-7).

Although there are other procedures used to compute the center of balance for vehicles, the above procedures must be followed when you use the computer aided load manifest (CALM) computer program currently used in the NCF.

To find the C/B of a track vehicle (dozer), drive the vehicle onto a wooden beam until it balances (fig. 2-8). The weight of a track vehicle is determined

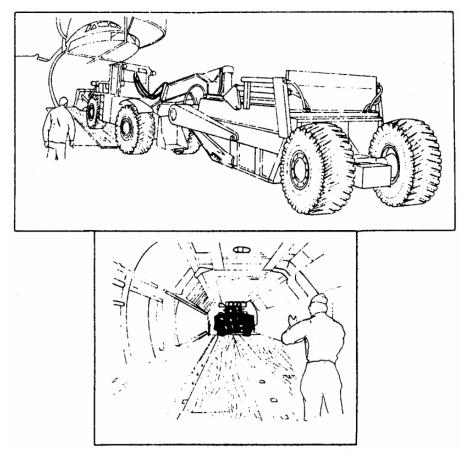


Figure 2-9.-Roller shoring.

by laying wood on top of the scales and driving the dozer onto the wood. The sum of the weight of the scales provides the GVW.

Once all the weights have been computed, they are marked on both sides of the vehicle and are annotated on the manifest list. The vehicle is then staged on the scheduled chalk.

Members of the air det must be highly qualified in both vehicle and cargo weighing and marking procedures because upon completion of the mission, the air det is responsible for mounting itself out to return home.

#### **SHORING**

Shoring is required for any type of equipment or cargo that can create metal-to-metal contact

aboard the aircraft. Shoring for individual equipment is usually precut, banded, and marked with the USN number of the equipment and accompanies the piece of equipment on the aircraft. The weight of the shoring must be included in the weight of CESE. The shoring is placed on CESE at the weighing and marking station which should be close to the location where the shoring is to be used.

Roller shoring (fig. 2-9) is required for tracked equipment. Roller shoring protects airport parking ramps and the cargo floor or loading ramps of cargo aircraft.

Parking shoring (fig. 2-10) is required for grader blades, front-end loader buckets, rollers, and so forth. Any vehicle requiring roller shoring requires parking shoring. The minimum thickness of parking shoring is three-fourths inch. Parking shoring is also required

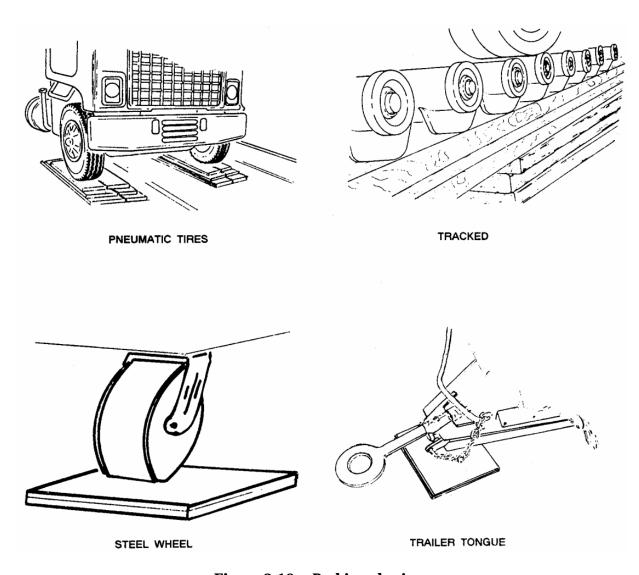


Figure 2-10.—Parking shoring.

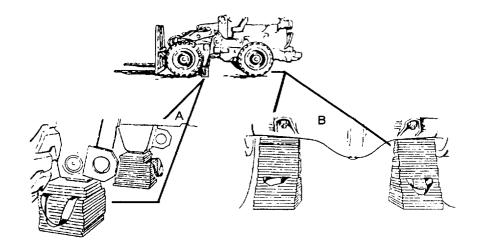


Figure 2-11.-Sleeper shoring.

for all vehicles and cargo that exceed aircraft specific floor weight limitations.

Sleeper shoring (fig. 2-1 1) is used under the frame or axle of a vehicle that exceeds 20,000 pounds and is equipped with soft tires. This shoring is used to prevent the vehicle from bouncing up and down and possibly pulling the tic-down rings out of the aircraft floor.

Approach shoring (fig. 2-12) is used to decrease the approach angle of aircraft loading ramps, because some items of cargo will strike the aircraft or ground during loading or off-loading operations. Long vehicles, such as low-boy trailers, that have limited ground clearance require a varying amount of approach shoring.

The air det must maintain custody of all shoring throughout the mission. Shoring should not be used as tent flooring, tables, or as chairs. Shoring can be easily misplaced and should be stored off the ground in one location to prevent insect infestation, rot, or theft. The equipment platoon should account for all shoring assigned to each piece of CESE because this shoring will be required for additional airlift plans. Shoring requirements for air certified air det CESE is listed in the *Naval Construction Force Embarkation Manual*, COMSECOND/COM-THIRDNCBINST 3120.1 series.

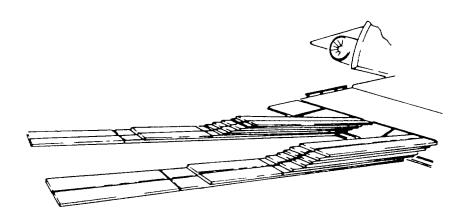


Figure 2-12.—Approach shoring.

### PALLETIZED CARGO

Pallets and pallet nets are procured from the Air Force. The 463L pallet (fig. 2-1) is standard system for the movement of concentrated cargo used by the Air Force. Military airlift aircraft are equipped with a dual-rail system consisting of rows of rollers which allow 463L pallets to move easily into and out of the aircraft. The 463L pallet is made of corrosion-resistant aluminum and has a soft wood core. The pallet has an outside dimension of 108 inches by 88 inches and is 2 1/4 inches thick. The cargo area space is 104 inches by 84 inches which is enough space to

allow 2 inches around the 436L pallets to attach straps, nets, or other restraint devices. A 436L pallet weighs 290 pounds empty and has a maximum load capacity of 10,000 pounds; however, to prolong pallet life, a load placed on a pallet should not exceed 7,500 pounds.

Pallet nets provide adequate restraint for 10,000 pounds of cargo when properly attached to the 463L pallet. There are three nets to a set: two side nets and one top net (fig. 2-13). The side nets are green in color, and the top net is yellow. The side nets attach to the rings of the pallet, and the top nets are attached by hooks to the side nets. These nets have multiple

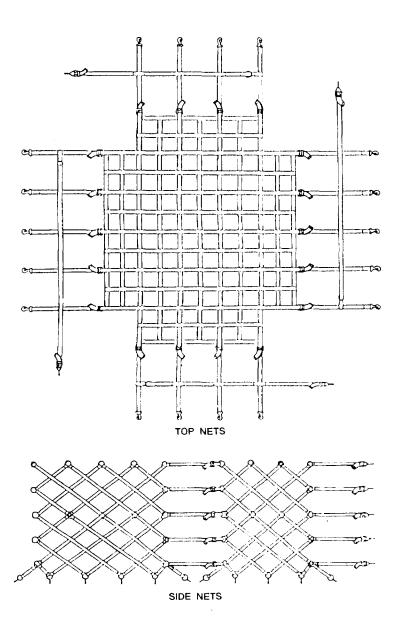


Figure 2-13.—463L pallet nets.

adjustment points and may be tightened to fit snugly on most any load. A complete set of 463L nets (three nets) weighs 65 pounds. Other cargo restraints are chains and chain tic-down devices. These are used for large items, such as Conex boxes, Seabee shelters, and refer units, and so forth. Five-thousand-pound tie-down straps (fig. 2-14) are used to secure equipment attachments and provide individual item restraints. Additionally, the tie-down straps provide supplemental restraint to the 463L pallet nets.

Cargo is palletized from the heaviest to the Large and heavy objects are distributed evenly from the center of the pallet outward to prevent the pallet from becoming heavy on one end (fig. 2-15). Additionally, this helps maintain the center of balance at or new the center. Lighter or smaller items are positioned on top or along the side of the heavier cargo, Containers marked "THIS SIDE UP" are placed upright, and cargo with special labels are faced outward whenever possible. Pallets should be constructed in a square or pyramid shape whenever possible (fig. 2-16). This makes the load stable, easy to handle, and easier to secure on the pallet. Each 463L pallet requires dunnage under the pallet when not on board the aircraft. The dunnage consists of three pieces of 4-inch by 4-inch by 90-inch timber and is placed in the center and close to the outside edges of the pallet. This prevents the pallets from warping and enhances forklift operations. Each aircraft has restrictions as to the dimensional size and shape particular to that specific aircraft. Aisleways must be built on pallet position three or four in a C-130 aircraft. Check the particular requirements of the aircraft for which the load is prepared.

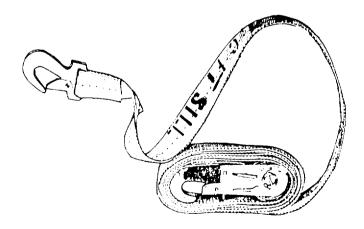
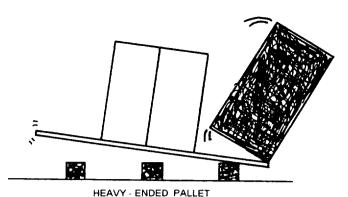


Figure 2-14.—5,000-pound tie-down strap.



(Constant)

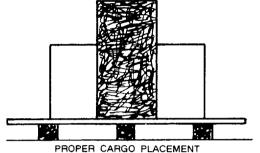
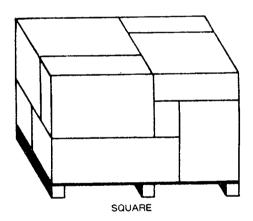


Figure 2-15.— Pallet cargo placement.



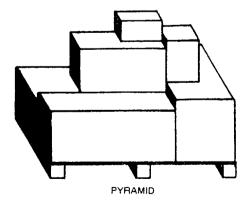


Figure 2-16.—463L square and pyramid pallet cargo placement.

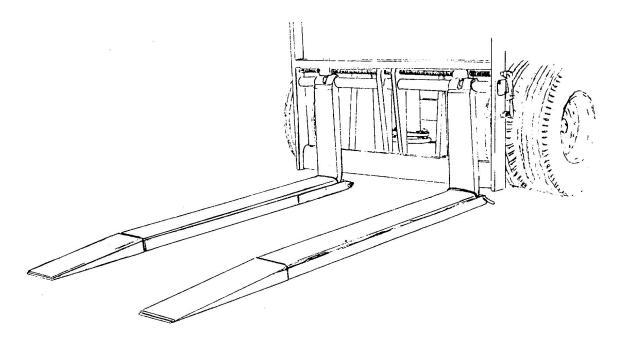


Figure 2-17.—Bare tine extenders.

The marking of the center of balance is not necessary on individual 463L pallets. When 463L pallet loads are built correctly, the center of balance will be at or near the center. The pallets are weighed by using portable scales. The weight of the dunnage must be weighed with the pallet. The scaled weight of the pallet is recorded on the manifest and labeled on each side (88-inch dimension) of the 463L pallet.

Handling and loading 463L pallets with a forklift requires the use of fork extensions (tine fork extenders in order to support the weight and size of the pallet fully. Technical publications that govern loading procedures for aircraft require forklift tines be a minimum of 72 inches in length.

Tine extenders are designed in two configurations: bare tine extenders (fig. 2-17) and rollerized tine extenders (fig. 2-18). The rollerized version of tine extenders is best suited for the rapid handling of 463L pallets, while the bare tine extenders are more useful in pallet building and the placement of mobile loads on beds of vehicles. Either type of extender is acceptable and can be locally manufactured; however, extreme care must be exercised when handling 463L pallets, because the tine tips can easily damage a pallet surface and render it unusable. To allow for unloading aircraft and handling pallets at the campsite, you must ensure a set of tine fork extensions are embarked with the cargo

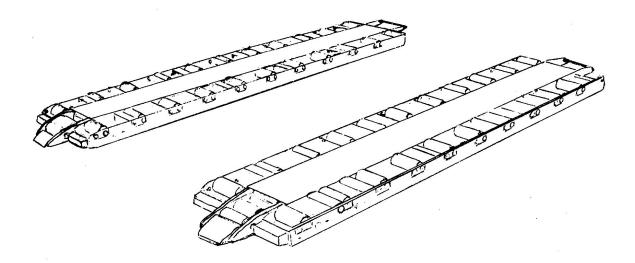


Figure 2-18.—Rollerized tine extenders.

and CESE. The 12K Lift King forklift currently assigned to the NCF TOA has a set of roller tine fork extensions assigned as an attachment.

Once the air det has arrived on site, the pallet loads are usually broken down and a supply area is set up for material and tool distribution. Never leave the pallets, pallet nets, chains, chain tie-down devices, and even the 5,000-pound cargo straps laying around. When you do, there is a good chance they will be rendered useless after being run over, walked on, buried, or otherwise damaged or destroyed. The recommended procedure for storing pallets is to place down three sets of 4-inch by 4-inch dunnage and stack the pallets ten high. Then, place three more sets of 4-inch by 4-inch dunnage and stack ten more pallets. Never stack pallets upside down. This could damage the rings or the aluminum surface. Also, never stack pallets over 40 high. Store all the 4-inch by 4-inch dunnage, chains, chain tie-down devices, and cargo straps in one location, and protect pallet nets from adverse climatic conditions. The netting materials may mildew and deteriorate, and the metal hooks can rust if not properly cared for. The air det must maintain custody of 463L pallets, pallet nets, 4-inch by 4-inch dunnage, chains, chain tie-down devices and cargo straps throughout the mission. These items are extremely expensive to purchase and refurbish and could be required for future airlift plans.

## **COLLATERAL EQUIPAGE**

The Alfa company collateral equipage custodian delegates the responsibility and accountability of the air det CESE collateral equipage and attachments to the equipment platoon supervisor. This area of responsibility is usually delegated to the assigned air det collateral equipage custodian. The custodian needs to acquire a list of the collateral equipage and attachments embarked with the air det CESE. The responsibilities of the air det collateral equipage and attachment operation are the same us the battalion and is outlined in Equipment Management, COM-SECOND/COMTHIRDNCBINST 11200.1 series and covered in chapter 1 of this TRAMAN. Proper management of collateral equipage and attachments enhances YOUR equipment management program for the air det. When this area is neglected, a high cost air det collateral equipage and attachment turn-in can occur and detract from any effective equipment management program you may have attempted to enforce.

## **SITE SELECTION**

The equipment platoon supervisor works closely with the air det staff when considering an area to set up the equipment platoon operations. The selection of the site depends upon the mission, the terrain, and climatic conditions. When possible, locate the equipment platoon operations close to the center of activity to allow the equipment to be used economically and efficiently.

Drainage must not be overlooked. In some areas you may already have natural drainage, while other areas may require construction of extensive drainage systems. You must remember that large-scale grubbing operations often produce damaging environmental effects. Save as much vegetation as possible to prevent soil erosion.

Allow adequate space to turn around tractor-trailers, to build an equipment loading ramp, to build an equipment parking area, and an area for equipment maintenance operations. Consider areas to disperse the equipment in a tactical environment to lessen possible damage from rocket or mortar attacks. Equipment parked in a neat, close file or in rows present large targets. Additionally, make sure entrances and exits are laid out to allow for a smooth flow of traffic and wide enough to accommodate the largest piece of construction equipment.

Other areas to consider are as follows: locations for collateral equipage and attachments, dispatch and maintenance tents, POL storage, storage for vehicle shoring, storage for the 463L pallets, and the vehicle wash area.

# SITE ARRIVAL

When the air det embarks by airlift, all members of the air det are listed on the manifest and are scheduled to fly by chalk numbers. The number of passengers (PAXs) allotted on an aircraft depends on the weight of the cargo or CESE loaded on the aircraft. The Equipment Operators (EOs) assigned to a specific CESE accompany that CESE aboard the aircraft.

Normally, EOS are assigned, with support from other ratings, the duties of the Arrival Airlift Control Group (AACG). The AACG group is usually scheduled to fly out on the first chalk, and at the mission site supports the Air Force with the unloading and staging of cargo and CESE from the aircraft. The

AACG group normally remains at the air base until all the scheduled chalks arrive at the mission site.

The equipment platoon transports cargo, baggage, CESE, and personnel from the air field to the deployment site. This movement may require a tactical convoy or a nontactical convoy procedure. Convoy procedures are outlined in the *Naval Construction Force Embarkation Manual*, COM-SECOND/COMTHIRDNCBINST 3120.1 series, and *Equipment Management*, COMSECOND/COM-THIRDNCBINST 11200.1 series.

During the first few days of an air det mission, before the supplies and CESE arrive and the camp is completed, the troops endure abnormal living conditions which can be detrimental to their morale. Once the supplies start to arrive, the set up of priority areas should immediately begin. These areas are the shower tent for hot showers, the galley tent for hot meals, and berthing tents to store gear and to sleep in. When provided properly, these facilities will make a PROFOUND difference in the morale and welfare of the troops.

The support platoon has the key responsibility for the camp setup. Some of the platoon's responsibilities are: camp electrical distribution, camp tent layout, galley facilities, shower facilities, laundry facilities (depending on the duration of the mission), medical facility, communications gear setup, latrines, and so forth. The construction of an air det camp is an <u>"all hands"</u> effort.

Delays can hamper plans for personnel, supplies, CESE, and construction operations and force the air det to have to regroup and manage with the resources on hand. Therefore, every operation the air det is involved in must be prioritized.

## **EQUIPMENT PLATOON OPERATIONS**

The equipment platoon primary responsibility is to support the requirements of the support platoon; however, it also has its own areas of responsibility. One area of responsibility is the control and accountability of CESE. When control and accountability of CESE is delayed and not implemented at the start of the mission, problems are sure to develop. Some problems you can expect are unexplainable damages to CESE, lost keys, neglected operator maintenance, loss of collateral equipage, and even theft.

Dispatch operations must start at the very beginning of the mission. All operators who are assigned to fly with a piece of CESE must report to the dispatcher when the CESE arrives at the mission site. The dispatcher should have an equipment status board that denotes the status of all CESE and have an area to secure equipment keys. Dispatch operations may have to be performed out of a box before the dispatch tent is erected. The dispatcher must plan for these situations. The best method for control and accountability is to Class "C" assign all CESE.

The air det has to account for all hours and mileage put on CESE during a mission. The equipment platoon supervisor is responsible for reviewing dispatch logs and trip tickets as outlined in *Equipment Management*, COMSECOND/COM-THIRDNCBINST 11200.1 series, for an Alfa company operations supervisor.

The equipment platoon supervisor must stay on top of all equipment-related operations of the air det During the first few days of a mission, the forklift is one of the most important pieces of CESE. The forklift is required to reassemble CESE, break down pallets, move tent boxes, unload tractor-trailers, and so forth; therefore, to ensure the optimum usc of the forklift, these tasks must be prioritized.

You must remember that SAFETY IS PARAMOUNT and CESE must be reassembled Reassembling CESE is a timebefore use. consuming forklift operation that delays individual priorities of other members of the air det. Therefore, it must be understood and enforced that tasks do not always have to be accomplished with the support of equipment and that waiting for the availability of the equipment is not worth the time wasted. Use troops to accomplish tasks that can be done manually (manual labor). Examples are: breaking down pallets, digging latrines, moving tent boxes, unloading trucks, and so forth. These tasks must be accomplished with or without the support of equipment.

The equipment platoon also has the responsibility to check and fill the water buffalos with potable water, maintain the water in the shower water bladders, and make daily garbage runs. These areas must not be overlooked during the planning phase. A piece of CESE (water truck, dump truck) will have to be dedicated to support this task. Water buffalos normally embark empty unless it is determined that potable water is not immediately available.

Equipment repair operations and the use of POL products and 55-gallon fuel drums must be closely monitored to avoid any contaminating spills. Lubricating oil, fuel, hydraulic fluids, transmission fluids, and antifreeze contain hazardous chemical When these items are mishandled and spilled, they can leak into the groundwater system or into the human food chain. Mishandling the "hurdy-gurdy" while dispensing fuel in vehicles or in fuel cans can cause excessive fuel spills that can be disastrous to the environment. Fifty-five-gallon fuel drums and POL products should be stored at least 50 feet away from any structure and located so vehicles and equipment can be easily topped off at the end of each day. Depending on your mission, the POL products and 55-gallon drums should be in a protected position (away from likely avenues of attack) that provides protection to the fuel storage area as well as to adjacent facilities. Fire extinguishers must be placed for easy accessibility and "No Smoking" signs must be posted in the POL products and fuel storage area.

Embarked with limited resources, the maintenance field crew and field crew truck play a major role throughout the air det mission. The field crew truck is loaded with the necessary tools and consumable supplies. These tools and supplies support the reassembling of CESE, setting up light plants, setting up camp electrical supply (generators), repair of hand tools, and so forth. Additionally, the maintenance field crew is required at the airfield during aircraft flight unloading operations in case a piece of CESE can not start or breaks down while on board the aircraft. Depending on the mission, the maintenance field crew truck can be used for delivering fuel by loading and securing a 55-gallon drum of fuel in the back of the truck. This expidites fuel runs for equipment on construction projects or for the camp generators. The requirements for maintenance field crew support requires a radio for communications with the maintenance field crew and the air det camp. A field crew must be equipped with the proper communication capability to respond to mission requirements expeditiously.

The air det maintenance supervisor should direct the operations of the maintenance field crew and also know the status of all CESE assigned to the air det. The maintenance supervisor has the responsibility to set up the maintenance shop and set up a preventive maintenance schedule for CESE assigned. All maintenance peerformed that requires repair parts, lube oils, or exceeds one man-hour must be documented.

Depending on the duration of the mission, the air det normally schedules means for logistic support and communications with the main body. Equipment repair parts not covered in the mod 96 or mod 98 normally can be acquired through this logistic support. The air det maintenance and equipment management program should mirror that of the main body. The management guidelines are provided in *Equipment Management*, COMSECOND/COMTHIRDNCBINST 11200.1 series.

The success of the air det mission is primary, but should not be attained at the cost of destroyed CESE. Operator's maintenance is mandatory and must be strongly enforced by the entire air det chain of command. CESE damaged by operator negligence or lack of operator maintenance is unacceptable. Equipment failure can seriously jeopardize mission success.

## **PROJECTS**

The primary purpose of the construction platoon is to perform construction operations for the air det with the support of the equipment and support platoons. Construction tasking covers a large range of tasks that include disaster recovery operations, war damage repairs, rapid runway repairs, humanitarian relief, and constructing advance base functional components. The tailoring of ratings assigned to the air det is dependent upon the extent and variety of the assigned tasking.

The amount of time allotted to plan construction projects depends on the urgency of the air det to embark to the mission site. Urgent situations can cause the air det to embark and manage construction projects with just the basic TA41 items. The equipment platoon supervisor has to plan CESE support for the construction projects, and priorities should be set up as soon as possible due to the limited amount of CESE embarked with the air det. Remember, priorities are subject to change, depending on operational conditions.

## AIR DET MOUNT-OUT/RETROGRADE

At the completion of the mission, the air det receives orders from higher command to prepare to mount-out to relocate or to return to the main body site. The air det will have to mount-out itself to include the weighing and balancing of CESE, building pallets, developing load plans, and developing convoy procedures, if required. The air

det should divide into two shifts (fig. 2-19) to achieve maximum production and to avoid overworking the troops.

The equipment platoon supervisor plays a key role, along with the air det staff, when prioritizing CESE and supplies to be mounted out. Certain CESE and supplies, such as tractor and trailers, forklifts, the maintenance field crew truck, light plants, and various tools, are required. These CESE and supplies are used to support the building of pallets, disassembly of CESE, breakdown of the camp, garbage runs, hauling of CESE, and transport supplies and personnel to the staging area. This movement from the campsite to the airfield may require a tactical or nontactical convoy procedure.

Another area the equipment supervisor must consider is a productive method for washing and

preparing CESE for the mount-out. The task of cleaning CESE is one that must not be overlooked and should be addressed before deploying to the mission site. The prepping of CESE in the field can be a time-consuming task and, if not properly planned, could result in not meeting the deadline for the joint inspection.

An efficient means for washing CESE is to locate a washrack or to build one. Some considerations in selecting the location of the washrack are as follows: the distance the CESE must be driven once it has been washed, the amount of water required to wash each piece of CESE (if using the water truck), and the distance the water truck must travel to obtain water.

A pressure washer located at the washrack is desirable and should be augmented to the air det; however, they are sometimes hard to obtain. Some

SAMPLE AIR DETAIL MOUNT-OUT ORGANIZATION		
EMBARK OFFICER -		
LOAD PLANNERS		,
DASH TWO CERTIFICATION -		
	STAGING AND CESE PREPARATION	
PALLET BUILDING	DAY	NIGHT
CREW LEADER FORKLIFT OPERATOR		
CREW ONE		
CREW TWO		
CESE INSPECTOR		
WEIGHING AND MARKING		
CREW LEADER		
CESE PREPARATION		
CREW LEADER	· -	<del></del>
MECHANICS		
	-	
ARRIVAL / DEPARTURE AIRLIFT CONTROL GROUP (AACG / DACG)		
100	AACG	DACG
LPO FORKLIFT OPERATOR CREW		
ALTERNATES		

Figure 2-19.—Sample of the air det mount-out organization.

pressure washers require small quantities of water and can be connected to a water buffalo with a garden hose to provide a very efficient tool for washing CESE.

A de-bugging steam wash may be required on all CESE that is to be returned to the host country. Normally, this is a rule directed by the Department of Agriculture of the host nation.

After all the pallets are built and the CESE is prepared, the air det has the responsibility to develop its own load plans and to set up the marshaling area by chalks. A pre-JI inspection is normally held that allows the air det time to correct any discrepancy. Again, operators must stand by their CESE during the inspection.

The "fly away" can take several days; therefore, arrangements should be made for rations and berthing for those personnel who are scheduled on the last chalks. The maintenance field crew is normally among those personnel. The field crew is required to stand by to repair any unplanned breakdowns of CESE that are to be loaded on (he aircraft. Another group of personnel that remains at the airfield is the Departure Airlift Control Group (DACG). The DACG supports the Air Force with the loading and securing of CESE and 463L pallets onto the aircraft.

Normally, the majority of air det personnel are manifested to be on the first group of chalks to fly out. These members will have the responsibility to perform the air det retrograde. The retrograde is the period of time used to inventory, reorder, clean, and

turn in all the supplies and gear embarked with the air det.

Normally, CESE returning from the air det operation is directed through the maintenance shop. This allows CESE to receive an acceptance check before being returned to the field. The air det maintenance supervisor turns in all the EROs, 1250s, and vehicle history jackets (if deployed more than 30 days) used during the mission to the cost control clerk. The license examiner turns in all license related items and any accident reports to the battalion license examiner and the air det dispatcher turns in the closed out dispatch logs, hard cards, and mileage reports to the battalion dispatcher. All collateral equipage is inventoried and turned over to the battalion collateral equipage custodian.

After the completion of the retrograde, the air det chain of command will forward an after action report to the battalion chain of command. This report contains a daily diary of events, the personnel embarked, CESE and supplies embarked, task assigned and completed, man-days expended, and lessons learned, and so forth. Therefore, remember to keep records of lessons learned throughout the mission. This will support the after action report, plus help plan future missions

Remember, the final condition of CESE, the positive accountability of collateral equipage, and the positive accountability of tool kits are your final grade on how well the equipment management program was conducted during the air det mission.